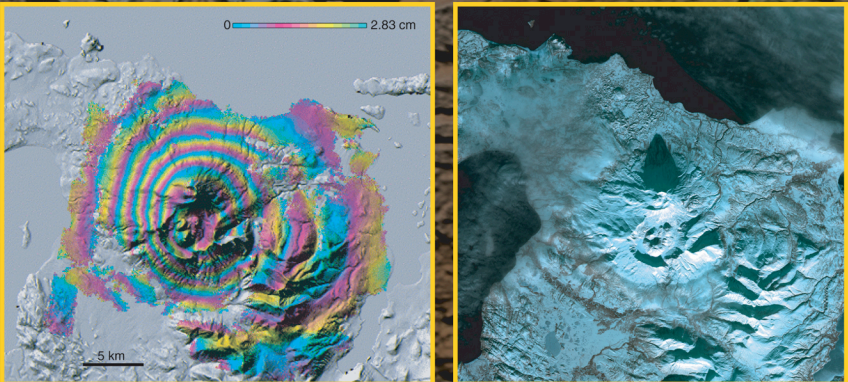


Natural HAZARDS

Sensing Tectonic Activity

NASA Earth observing satellites provide data beneficial for studying the physical, sociological, ecological, and economic impacts of natural disasters caused by tectonic activity, such as volcanic eruptions and earthquakes and resulting lava flows, tsunami, and flooding.

Volcanic Activity



October 1996 - October 1997
Image Courtesy of Dr. Z. Lu, USGS/EDC/SAIC

Image credit: Land Processes DAAC

Located in a remote area of Chile, Chiliques is a stratovolcano previously thought to be dormant. ASTER nighttime thermal data (90 m) imaged a hot spot (white) January 6, 2002 in the center and several others along the upper flanks of the edifice. The 15 m high resolution ASTER November 19, 2000 daytime image shows the detailed volcanic features.

Peulik, a stratovolcano in Alaska, is known to have erupted in 1814 and 1852. The InSAR image (far left) is a geo-referenced interferogram overlaid on a shaded relief image showing ~17 cm of uplift centered on the southwest flank, which occurred during an aseismic inflation episode from October 1996 to September 1998. The 15 m resolution ASTER image (left) shows an ice covered Peulik on November 5, 2001.

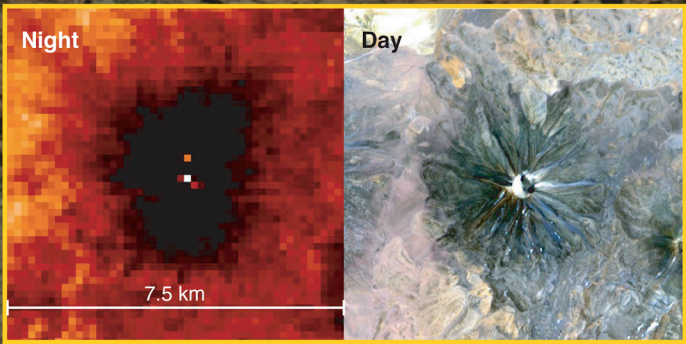


Image Credit: NASA/GSFC/METI/ERSDAC/JAROS and US/Japan ASTER Science Team

2004 Earthquake and Tsunami

Satellite observations are being used to observe and monitor the geological and ecological changes caused by the 9.0 magnitude Sumatra/Andaman Islands earthquake and the resulting tsunami and flooding.

Displayed in blue (right) is the height of sea surface measured by the Jason satellite two hours after the earthquake hit the region southwest of Sumatra on December 26, 2004.

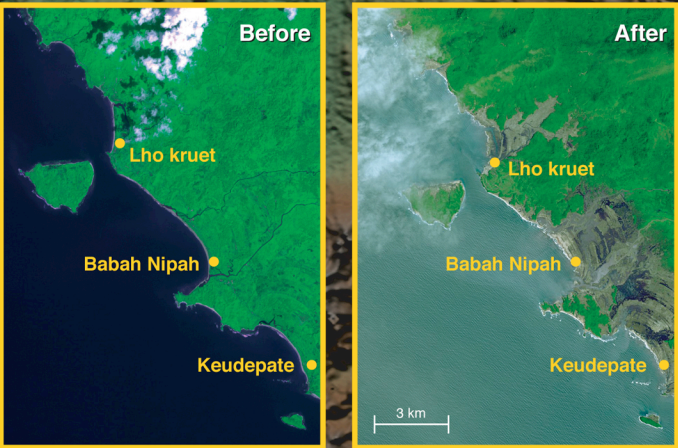


Image Credit: NASA/EOSDIS

Image Credit: NASA/GSFC/METI/ERSDAC/JAROS, and US/Japan ASTER Science Team

High resolution ASTER images (15 m) above, compare the region before (January 6, 2002) and after (January 12, 2005). Note the extensive erosion and devastation that extends several kilometers inland. These coastal villages were completely destroyed.

One of the most serious threats to humans along the coast after the tsunami was flooding and the resulting standing and cross-contaminated surface water. The map of northern Sumatra (right) shows the more highly populated coastal areas of the Aceh (1) and Sumatera Utara (2) Provinces.

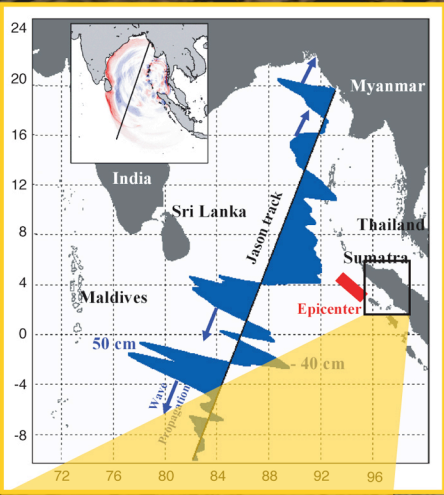


Image Credit: NASA/JPL/CNES/NIAIST



Copyright 2005 Trustees of Columbia University in the City of New York, Center for International Earth Science Information Network, Columbia University; International Food Policy Research Institute, the World Bank; and Centro Internacional de Agricultura Tropical, 2005. Global Rural-Urban Mapping Project: Palisades, NY, CIESIN, Columbia University.